

**TECHNICAL SPECIFICATION SECTION**  
**Mobile/Trailer Units from 35 Kw to 500 Kw**

**GENERATOR SET/ MOBILE UNITS**

**1. GENERAL**

It is the intent of the specification to secure an emergency system that has been prototype tested, factory built, production tested, site tested, of the latest commercial design, together with all accessories necessary for a complete installation as specified herein.

The equipment supplied and installed shall meet the requirement of the National Electric Code and all applicable local codes and regulations. All equipment shall be new, unused and of current production by a firm that has its final assembly located in the continental United States. The generating set manufacturer shall have at least twenty-five (25) years experience assembling generating sets. The engine/generator, controls, disconnect shall be complete assembled and wired by the generator manufacture and locally authorized dealer to ensure one-source responsibility for warranty, parts, and service through factory-trained service personnel.

**2. SUBMITTAL**

Submittal shall include specification sheets showing all standard and optional accessories to be supplied, schematic wiring diagrams, dimensional drawings, and interconnection diagrams.

**3. RATINGS**

The standby generator set shall be rated as standby power at ??? kw (defined as continuous operation for the duration of any power outage). Kilowatt ratings for three-phase voltages are based on a 0.8 power factor, single-phase voltages are based on a 1.0 power factor. Ratings are established on 150 feet altitude and 110° Fahrenheit, as manufactured by Tradewinds Power Corp or purchaser-approved equal. Vibration isolators shall be provided between the engine-generator and the steel sub-base, fuel tank or directly to mounting pad.

Refer the county for generator applications for sizing.

- A. Tradewinds /Perkins Power. Sure-Gen 910-253-0484
- B. Cummins;Atlantic Inc. 252-237-9111
- C. CaterpillarGregory Poole 919-890-4646

**4. ENGINE**

The prime mover shall be a liquid-cooled #2 diesel-fueled engine of 4-cycle design, equipped with the following:

- A. Mechanical or electric fuel transfer pump, primary and secondary fuel filters, water separator, and electric fuel shut-off valve.
- B. Electronic governor capable of regulating the no load to full load frequency to a .25% maximum, steady state regulation shall be .25%.

- C. 12-volt positive engagement solenoid shift-starting motor.
- D. 12-volt belt-driven battery charging alternator with solid-state voltage regulation.
- E. Positive displacement full pressure lubrication oil pump, cartridge oil filters, dipstick and oil drain.
- F. Dry replaceable, dual element “heavy duty type” air cleaner.
- G. Unit-mounted radiator, pusher type cooling fan, water pump, thermostat and radiator duct flange (non-enclosed units) shall properly cool the engine and be designed for operation at a minimum ambient temperature of 120° F.

## 5. ALTERNATOR

The alternator shall be a 4-pole revolving field type with 12 reconnectable leads, self-ventilated and of drip-proof construction. The insulation material shall meet the NEMA standard (MGI-22.40 and 16.40) for Class H. The excitation system shall be of brushless construction controlled by a solid-state voltage regulator with adjustable volts-per-hertz tracking.

On application of any load up to the full rated load the voltage dip shall not exceed 12.5% and shall recover to stable operation within two seconds. The alternator shall be capable of sustaining at least 250% of rated current for at least 10 seconds under a 3 phase symmetrical short by inherent design or by the addition of an optional current boost system. The alternator shall be capable of accepting the loads and instantaneous voltage dip when loads are started as specified

The generator shall be directly connected to the flywheel housing and by means of a shaft through a flexible drive plate coupled between the alternators rotating mass and the engine flywheel for permanent alignment. A ground cable will be installed between the alternator foot and the support crossmember. The generator shall have a voltage selector switch with the following voltages three phase 120/208 low wye, 277/480 high wye, 120/240 delta. There shall be a remote voltage adjust rheostat.

## 6. GENERATOR/CONTROLLER

Generator controller shall be an integral part of the overall weather enclosure and shall have three points of interface so that panel can be removed and replaced quickly as and if required. A separate D/C twist lock receptacle shall be provided for all D/C interfaces to the generator control panel from the generator set. A separate A/C twist lock receptacle shall be provided for all A/C interfaces to the generator control panel from the generator set. A RS 232 connector shall be provided and installed through the control panel box to allow access to the controller without having to remove the controller from the box. This plug-in device will be capable of allowing maintenance personnel to test controller performance without operating the engine. All wire shall be rated for peak A/C voltage and shall be number stamped as indicated in the electrical schematic. The enclosure shall be constructed of .090-gauge aluminum. The microprocessor control board shall be moisture proof and capable of operation from -40° to 85° Celsius.

The digital generating set controller shall be provided utilizing microprocessor-based technology and provide:

- A. CAN Bus option to connect to standard SAE J1939 engine management systems. Error codes will be displayed in numerical and text format.
- B. Comprehensive remote communications via optional RS232 port. Full 2 way communication and panel supports GSM SMS messaging system.
- C. Engine instruments: Oil pressure, water temperature, actual engine hours run, charging voltage, battery volts and engine rpm.
- D. Generator Instruments: Volts, Hz, Amps, kW, kVA, Power factor
- E. 16 bit micro processor control
- F. Optional RS 485 'Modbus' output.
- G. LCD 4 line text based backlit display
- H. PC configuration and status monitoring using 5xxx PC software
- I. PIN number front panel programming protection for selected trip points and timers to allow in field adjustments
- J. Built in exerciser times
- K. Sleep mode to conserve battery life
- L. Automatic and manual operation modes
- M. Six configurable auxiliary inputs for connection to external fault detection equipment-expandable to 14 auxiliary inputs along with three configurable outputs
- N. Integral load switch control capability
- O. Able to survive 0V for 50mS without internal batteries
- P. Ability to be configured for use with a 16 light remote annunciator. Range is 1000 meters over standard wires (NFPA 110)
- Q. Optional 8 light remote annunciator and 8 dry relay contacts-Fully programmable.
- R. Ability to communicate with Thompson Technologies automatic switch
- S. Enclosure protection IP55 with gasket
- T. Multiple display languages
- U. Auto scroll display
- V. Integral load switch capability
- W. Pre-alarms and shutdowns for generator voltage, frequency and amps.
- X. Adjustable high current shutdown alarm-IDMT curves.

- Y. 4 configurable LED's on front panel-Warnings, shutdowns or Status indicators
- Z. Event log
- AA. Fuel level input with transfer pump control
- BB. Multiple wiring topologies supported-Front panel configurable
- CC. UL, CE and CUL approved
- DD. Generator available LED
- EE. Close generator output LED

## 7. ACCESSORIES

The following accessories, as required, shall be installed, and completely wired to ensure that no site installation is required.

- A. Battery racks. Battery cables. 12-volt or 24-volt battery(s) capable of delivering the minimum cold-cranking amps required at zero degrees Fahrenheit ~ SAE Standard 1-537 for each particular kW rating. The battery rack shall be welded to the sub-base or fuel tank and shall have two hold down bolts with one cross over strap.
- B. Oil and water drain lines shall be installed and extended to the outside of the weather protective enclosure through bulkhead fittings. Each drain line shall include but not be limited to a brass ball valve and flexible lines. The ball valves shall be located on the interior of the package.
- C. Engine exhaust silencer shall be coated to be temperature and rust resistant and rated for critical applications. Exhaust noise shall be limited to 85 dba as measured at 10 feet in a free-field environment. Silencer is mounted within the structure of the weather protective enclosure. The silencer is connected to the engine by a stainless steel flexible pipe.
- D. The block heater shall be sized properly to carry the correct wattage and voltage for the engine chosen by the generator supplier. This block heater shall also be thermostatically controlled to maintain engine coolant at 90° F (32 degrees Celsius) to meet the start-up requirement of NFPA-99 or NFPA-110 regulations. If the line voltages do not match the required voltages, the manufacturer shall furnish and install the necessary transformer in the transfer switch compartment to convert the primary power source voltage to the voltage and current level required and should be wired to flush mount plug.
- E. Automatic float and equalize battery charger with constant voltage constant from no load to full load. Current limited during engine cranking and short circuit conditions. Temperature compensated for ambient *from* -40 degrees C to +60 degree C, voltmeter and ammeter fused, reverse polarity and transient protected. Optional alarm circuit board to meet the requirements of NFPA-110 for low battery voltage, high battery voltage and battery charger malfunction and should be wired to flush Edison mount plug.
- F. A duplex receptacle, GFCI type, is made available to route power from the normal source to the float charger and block heater. The float charger and block heater are connected to the float charger. There must be a male 15amp Edison plug mounted flush on the enclosure for plugging in the block heater and battery charger.
- G. Remote-stop button.

- H. Weather-protective enclosure constructed of marine grade aluminum white powder coat paint finish. The enclosure shall have removable and hinged side panels to allow inspection and maintenance. This enclosure shall be constructed from minimum-.090-gauge aluminum for units up to and including 35kW. Enclosures housing gensets larger than 35kW are constructed of 1/8" thick marine grade aluminum. All enclosures shall have stainless hardware throughout. The enclosure shall have a removable panel at the radiator end to allow access to the interior mounted exhaust silencer and for cleaning of the radiator cooling fins. The sound level of the enclosure without additional material added shall not exceed 78 dBA at a distance of 7 meters.
- I. Sound attenuation material added to the enclosure will be constructed of 1-inch adhesive backed foam.
- J. The generator set will be fitted with a mainline circuit breaker(s), unless otherwise specified, sized a minimum of 15% above the rated amperage. This breaker will be mounted on the side of the alternator conduit box with rubber anti-vibration mounts and be adjustable to +- 50% of the rated current.
- K. The generator shall have a voltage selector switch with the following voltages three phase 120/208 low wye, 277/480 high wye, 120/240 delta the switch shall be able to carry the full load current output of the generator. There shall be a remote voltage adjust rheostat provided.
- L. The generator shall have type j cam-lok's with protective covers install, wired to the load side of the breaker and mounted on the back side of the generator. The cam-loks shall be color coded brown, orange, yellow, white and green.
- M. Single wall steel fuel tank shall be provided adhering to UL code 142 requirements. A fuel level gauge, 4-20mA analog level transmitter and low-level alarm contact shall be provided to annunciate the fuel level on the generator control panel. The fuel tank shall have a lifting eye on each corner constructed of 3/8 structural steel plate. 36 hour run time tank. The tank will be fitted with a fuel drain fitting to remove the diesel fuel from the tank. The fuel tank shall be provided with a lockable fuel fill cap, suction and return pipes.
- N. Genset is fitted with a fuel/water separator.
- O. Trailer Specs
- Tandem DEXTER type 3,500 lb. axles
  - 2-5/16" ball coupler
  - 2,000 lb. tongue jack with sand shoe
  - DOT wiring package – enclosed in 1/2" steel conduit
  - 6 way round trailer plug
  - Stainless steel flush mount tail lights
  - Rear stabilizer jacks
  - ST205/75D15 load range C tires on white spoke wheels
  - Fenders - heavy duty steel plate
  - 2-5/16" x 30 safety chains with 3/8" hooks
  - Electric brakes with safety break-away
  - Integral single walled fuel tank (up to 130 gal. capacity)
  - Direct reading manual fuel gauge
  - Fuel fill and vent
  - Fuel pick-up and return ports
  - Mounting rails for your specified genset
  - Primed gray primer

- Semi-gloss black finish
- GVWR 7,000 lbs.
- Load capacity (less fuel) approximately 5,700 lbs.
- Deck size 48" x 120"
- Deck height 28" (approx.)
- Hitch height 22" (approx.)
- Empty weight 1,300 lbs. (approx.)

**9. SUBMITTAL AND WARRANTY**

- A. Submittal shall include specification sheets showing all standard and optional accessories to be supplied; foundation plan; schematic wiring diagrams; dimension drawings; and interconnection diagrams identifying by terminal number of each required interconnection between the generator set and the voltage selector switch. Equipment shall not be released for manufacture until submittal materials are approved.
- B. The manufacturer shall warrant the generating set against all manufacturing defects for a period of three-years or 1,500 hours (maximum of 500 hours per year), whichever occurs first, from the date of system start-up. The warranty period shall commence from the date of system start-up but no later than six months from the date of shipment from the manufacture.

